

Kinetic Analysis of Facial Soft Tissue with Twin Block during Mandibular Movement

Kazuki OUE, Tatsuo RYU and Toshihiko HIMURO

The aim of this study was to elucidate dynamic state of the kinetics of facial soft tissue affected by use of a Twin Block appliance (TB). The subjects were 10 adult males (mean 25.4 ± 3.1 years old) with Class II division 1 malocclusion (Class II group) and 10 adult males (22.7 ± 10.2 years) with Class I malocclusion (Class I group). Individual TB appliances were prepared by registering the construction bite vertically after being raised by 2 mm at the incisors. The mandible was advanced stepwise to 4 protruding positions of 0, 2, 4, and 6 mm, as well as 3 dimensional positions noted by 18 markers, whose coordinates were converted from 3 forehead points determined in the directions of the x, y, and z axes using an optical motion capture system. For the task, tapping at 2 Hz was performed. The movement distance of the upper lip in the transverse direction was significantly less in the Class II group without an appliance than in the Class I group without an appliance. In contrast, that of the upper lip in the longitudinal and vertical directions was significantly greater in the Class II group at the 4-mm protruding position than in the Class II group without an appliance. Our results show that the motor function of the upper lip may be restored with use of a TB appliance.

Key words : kinetic analysis, soft tissue, twin block